What is claimed is:

1. An optical WDM transmission system using Raman amplification, said system comprising:

a length of optical fiber including a core region;

an optical transmitter for introducing a lightwave information signal into the optical fiber, the lightwave information signal including separate signal channels operating at three separate wavelengths, wavelength division multiplexed (WDM) to form the lightwave information signal;

an optical pump source for introducing optical energy into the core region of said optical fiber, whereby the optical pump energy interacts with the lightwave information signal to produce Raman amplification of said lightwave information signal, wherein the invention is characterized in that the optical fiber has the following properties:

low water peak at 1385 nm less than 0.4 dB/km;

zero dispersion wavelength (ZDW) less than or equal to 1355 nm, with only one ZDW across entire transmission band from 1310 to 1625 nm; and

chromatic dispersion (D) greater than 1 ps/nm-km at 1375 nm and less than 10 ps/nm-km at 1565 nm.

2. The system as defined in claim 1 wherein the optical fiber comprises an inner, high index core region and a surrounding, lower index trench region, a ring region surrounding said lower index trench region, a depressed cladding region and an outer cladding region formed to surround said ring region.

3. The system as defined in claim 1 wherein the optical fiber has a low water peak loss at 1385 nm of less than 0.35 dB/km.

4. The system as defined in claim 3 wherein the optical fiber comprises an inner, high index core region and a surrounding, lower index trench region, a ring region surrounding said lower index trench region, a depressed cladding region and an outer cladding region formed to surround said ring region.

5. A method for manufacturing an optical fiber, the method comprising the steps of:

a) providing an optical fiber preform;

b) heating said provided preform to the softening temperature; and

c) drawing an optical fiber from said softened preform, wherein the drawn optical fiber exhibits the following characteristics:

low water peak at 1385 nm less than 0.4 dB/km;

zero dispersion wavelength (ZDW) less than or equal to 1355 nm, with only one ZDW across entire transmission band from 1310 to 1625 nm; and

chromatic dispersion (D) greater than 1 ps/nm-km at 1375 nm and less than 10 ps/nm-km at 1565 nm.

6. The method as defined in claim 5 wherein the drawn optical fiber has the property of low water peak at 1385 nm of less than 0.35 dB/km.

7. The method as defined in claim 5 wherein in performing step a), the preform is provided by:

i. forming an inner core rod including an inner, high index core region and a surrounding, lower index trench region;

ii. forming an outer core tube including a raised index ring region and a depressed cladding region;

iii. collapsing the outer core tube around the inner core rod using an ultra-dry process; and

iv. overcladding the composite core structure formed in steps i. – iii. to complete the preform.

8. The method as defined in claim 7 wherein in performing step a)(i), a vapor-axial deposition process is used such that the attenuation at 1385 nm is less than or equal to about 0.325 dB/km.

9. The method as defined in claim 8 wherein the manufactured fiber exhibits a water peak loss less than 0.325 dB/nm at the 1385 wavelength.

10. The method as defined in claim 7 wherein in performing step a)(i), an outside vapor deposition process is used such that the attenuation at 1385 nm is less than or equal to about 0.325 dB/km.

11. The method as defined in claim 10 wherein the manufactured fiber exhibits a water peak loss less than 0.325 dB/nm at the 1385 wavelength.

12. The method as defined in claim 7 wherein in performing step a)(ii), a modified chemical vapor deposition process is used.

13. The method as defined in claim 12 wherein the manufactured fiber exhibits a water peak loss less than 0.4 dB/km.

14. The method as defined in claim 7 wherein in performing step a)(iii), a chlorine atmosphere, ultra-dry mating process is used.

15. The method as defined in claim 7 wherein in performing step a)(iii), a fluorine atmosphere, ultra-dry mating process is used.

16. The method as defined in claim 7 wherein in performing step a)(iii), a combination of a chlorine and fluorine atmosphere, ultra-dry mating process is used.

17. The method as defined in claim 7 wherein in performing step a)(i), a vapor-assisted deposition process is used, in performing step a)(ii), a modified chemical vapor deposition process is used, and in performing step a)(iii), a chlorine atmosphere ultra-dry mating process is used.

18. An optical fiber characterized by:

low water peak at 1385 nm less than 0.4 dB/km;

zero dispersion wavelength (ZDW) less than or equal to 1355 nm, with only one ZDW across entire transmission band from 1310 to 1625 nm; and

chromatic dispersion (D) greater than 1 ps/nm-km at 1375 nm and less than 10 ps/nm-km at 1565 nm.

19. The optical fiber of claim 18 wherein the fiber comprises an effective area in the range of 50 to 65 μm^2.

20. The optical fiber as defined by claim 18 wherein the fiber comprises an inner, high index core region and a surrounding, lower index trench region, a ring region surrounding said lower index trench region, a depressed cladding region and an outer cladding region formed to surround said ring region.

21. The optical fiber as defined by claim 18 with a low water peak at 1385 nm less than 0.35 dB/km.

22. The optical fiber defined by claim 21 wherein the fiber comprises an inner, high index core region and a surrounding, lower index trench region, a ring region surrounding said lower index trench region, a depressed cladding region and an outer cladding region formed to surround said ring region.

23. The method as defined in claim 5 wherein in performing step a), the method comprises:

i. forming an inner core rod including an inner, high index core region and a surrounding, lower index trench region;

ii. forming a raised index ring region by collapsing a high purity tube onto the inner core formed in step (i) with an ultra-dry process;

iii. forming a depressed cladding region by collapsing a high purity down-doped tube onto the outside of the ring region with an ultra-dry process; and

iv. overcladding the composite core structure formed in steps i. - iii. to complete the perform.

24. The method as defined in claim 23 wherein in performing steps a)(ii) and a)(iii), a chlorine atmosphere, ultra-dry process is used.

25. The method as defined in claim 23 wherein in performing steps a)(ii) and a)(iii), a fluorine atmosphere, ultra-dry process is used.

26. The method as defined in claim 23 wherein in performing steps a)(ii) and a)(iii), a combined chlorine and fluorine atmosphere, ultra-dry process is used.

27. The method as defined by claim 5 wherein in performing step a), the method includes the steps of:

i. forming a composite waveguide core comprising a raised index core, a depressed index trench, a raised index ring, and a depressed index cladding using a vapor-axial deposition process; and

ii. overcladding the composite waveguide core of step (i) to complete the perform.

28. The method as defined by claim 5 wherein in performing step a), the method includes the steps of:

i. forming a composite waveguide core comprising a raised index core, a depressed index trench, a raised index ring, and a depressed index cladding using an outside vapor deposition process; and

ii. overcladding the composite waveguide core of step (i) to complete the perform.